

CLAIMS

What is claimed is:

1. A bearing arrangement for supporting a universal joint trunnion in an outer cup, comprising:
a radial bearing having cylindrical rolling elements disposed between the trunnion and the cup; and
an axial bearing having a resistance member provided with a central axial projection for support of an end surface of the trunnion and having an outer surface resting against a bottom wall of the cup, wherein the resistance member is formed with openings or recesses spaced partially about its circumference for defining spaces for lubricant alone or in combination with a configuration of the end surface of the trunnion, and wherein the resistance member is provided about its circumference with first stop members projecting axially toward the end surface of the trunnion and defined by a length which is shorter than a length of the axial projection as to define a gap between the stop members and a confronting portion of the end surface of the trunnion.
2. The bearing arrangement of claim 1, wherein the trunnion has a bore in the end surface of the trunnion, said axial projection being constructed for engagement in the bore of the trunnion.

3. The bearing arrangement of claim 2, wherein the axial projection is constructed for engagement with clearance in the bore of the trunnion.
4. The bearing arrangement of claim 2, wherein the axial projection is press-fitted in the bore of the trunnion.
5. The bearing arrangement of claim 1, wherein the resistance member has second stop members disposed in alternating relationship to the first stop members, said second stop members having a length which differs from the length of the first stop members.
6. The bearing arrangement of claim 1, wherein the resistance member of the axial bearing is constructed to allow a multi-stepped support of the trunnion, when the trunnion is acted upon by an axial force.
7. The bearing arrangement of claim 1, wherein the resistance member forms an axial stop for the rolling elements.
8. The bearing arrangement of claim 1, wherein the bottom wall of the cup is formed without material removal with a gradation which ends in an axial surface area of a size that corresponds to a size of a surface area of the confronting axial projection.

9. The bearing arrangement of claim 1, wherein the trunnion has a flange projecting in axial direction from the end surface, wherein the bottom wall of the cup is formed without material removal with a gradation which ends in an axial surface area of a size that corresponds to a size of a surface area of the confronting flange.
10. The bearing arrangement of claim 1, wherein the bottom wall of the cup has a side distal to the end surface of the trunnion, said side of the bottom wall being formed with at least one step.
11. The bearing arrangement of claim 10, wherein the resistance member is centered at the step where the bottom wall is of smallest diameter, and wherein the axial projection of the resistance member has an axial length which is greater than a height of the step.
12. The bearing arrangement of claim 1, wherein the resistance member is made of two parts, one part being the axial projection and the other part being a ring element centered on the bottom wall of the cup.

13. A bearing arrangement for supporting a universal joint trunnion in an outer cup, comprising:
- a radial bearing having cylindrical rolling elements disposed between the trunnion and the cup; and
- an axial bearing having a resistance member disposed in concentric surrounding relationship to a central flange of the trunnion for support thereof and having an outer surface resting against a bottom wall of the cup, wherein the resistance member is formed with first stop members projecting axially toward the end surface of the trunnion and defined by a length which is shorter than a length of the flange as to define an axial gap between the stop members and a confronting portion of the end surface of the trunnion, and wherein the resistance member defines in combination with a configuration of the end surface of the trunnion spaces for introduction of lubricant.
14. The bearing arrangement of claim 13, wherein the resistance member of the axial bearing is constructed to allow a multi-stepped support of the trunnion, when the trunnion is acted upon by an axial force.
15. The bearing arrangement of claim 13, wherein the resistance member forms an axial stop for the rolling elements.

16. The bearing arrangement of claim 13, wherein the bottom wall of the cup is formed without material removal with a gradation which ends in an axial surface area of a size that corresponds to a size of a surface area of the confronting axial projection.

17. In combination:

a universal joint having a trunnion; and

a bearing arrangement for supporting the trunnion, said bearing arrangement comprising;

an outer cup disposed in surrounding relationship of the trunnion;

a radial bearing having cylindrical rolling elements disposed between the trunnion and the outer cup; and

a resistance member made of a material to allow elastic deformation and bearing upon a confronting surface area of an end surface of the trunnion, and

a stop member maintaining an axial distance of the end surface of the trunnion in relation to the resistance member to thereby form part of a lubricant reservoir and defining an axial gap with the end surface of the trunnion, said stop member inhibiting an axial movement of the trunnion after the trunnion has moved in axial direction to close the gap.

18. The combination of claim 17, wherein the end surface of the trunnion has a substantially U-shaped configuration to define a base, said resistance member having an end wall, which abuts against a bottom wall of the outer cup, and including a central portion to rest against the confronting surface area of the base to thereby demarcate a space forming another part of the lubricant reservoir.
19. The combination of claim 18, wherein the resistance member has a collar in a peripheral area of the resistance member for abutment against the rolling elements.
20. The combination of claim 19, wherein the stop member extends radially inwardly from the collar.
21. The combination of claim 17, wherein the end surface of the trunnion has a beveled edge.

22. The combination of claim 17, wherein the end surface of the trunnion has a substantially U-shaped configuration to define a base, said outer cup having a gradation, said resistance member having an end wall, which abuts against a bottom wall of the outer cup, and including a central portion press-fitted into the confronting surface area of the trunnion and bearing upon the gradation of the outer cup to thereby demarcate a space forming another part of the lubricant reservoir.
23. The combination of claim 19, wherein the collar and the central portion are separate parts.
24. The combination of claim 17, wherein the end surface of the trunnion has a cylindrical configuration.
25. The combination of claim 24, wherein the outer cup has a bottom wall which is formed at a peripheral area with a first step to provide the stop member, said resistance member having an end wall, which abuts against a bottom wall of the outer cup, and including a central portion to rest against the confronting surface area of the end surface of the trunnion, said collar and said first step demarcating the lubricant reservoir.
26. The combination of claim 25, wherein the bottom wall of the outer cup is formed with a second step which bears upon the rolling elements.

27. The combination of claim 24, wherein the trunnion includes a flange projecting in axial direction from the end surface, said outer cup being formed with a gradation which ends in an axial surface area of a size that corresponds to a size of a surface area of the flange, said resistance member having an end wall, which abuts against a bottom wall of the outer cup, and is formed with a collar bearing upon the rolling elements, said collar and said flange demarcating the lubricant reservoir, said stop member extending radially inwardly from the collar.
28. The combination of claim 24, wherein the trunnion includes a flange projecting in axial direction from the end surface, said resistance member having an end wall, which abuts against a bottom wall of the outer cup, and including a central portion bearing upon the confronting surface area of the flange, and a collar disposed in a peripheral area of the resistance member and bearing upon the rolling elements, said collar and said flange demarcating the lubricant reservoir, said stop member including a first stop extending radially inwardly from the collar, and a second stop connected to a cup-distal side of the end wall of the disk in an area between the first stop and the central portion.
29. The combination of claim 28, wherein the first and second stops have a different axial length.